

# Green infrastructure-based tourism development in a Hungarian case

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## 1. Abstract

The importance of green infrastructure (GI) has been particularly felt in the pandemic period: the opportunity to spend time and relax outdoors became more valuable for urban residents. There is a strong link between green infrastructure and tourism and recreation, but the ecosystem services of the GI have so far been less emphasized in tourism development planning. GI network elements can be attractions for tourism and sites for recreational activities. However, elements of the GI (such as a greenway) are also elements of tourism and recreation infrastructure.

The aim of the present research was to explore the potential of linking GI development and tourism development in a particular tourist area, the Balatonfüred micro-region in Hungary. In our previous research we have already dealt with the GI of this area, especially with the Nivegy Valley and its landscape based tourism development, therefore we chose this region as a sample area for our research. Some of the experience gained here can be generalised: the diverse landscapes with many small values which are not in themselves of great attraction, planned and managed together as a comprehensive network can be attractive for tourists. The view connections revealing in some places and the pleasant hiking trails offer both tourists and locals such a landscape experience that contributes to their physical and mental health.

Our specific proposals for GI development and tourism or recreation development in the Nivegy Valley can serve as an example for other areas, showing how well-planned green network can become a resource to serve the growing needs of tourism. At the same time, the proper design and condition of green infrastructure includes opportunities for recreation as well.

## 2. Introduction

We all experienced the importance of green infrastructure in the pandemic period, when urban population had seeking shelter and recreation in various green spaces, open spaces, parks, forests and even agricultural land. Those who could, spent the winter months in their holiday homes, and the promenades along the shores of Lake Balaton were full on weekends. Small gatherings of friends and family took place outdoors - often away from built-up areas to minimize the risk of infection. These experiences have strengthened our view of green spaces as a tourist attraction, but as landscape architects we have also noticed the shortcomings of the green infrastructure network as a tourist attraction.

Among the ecological services provided by green infrastructure, recreational and tourism services are generally less used in tourism development planning, even though elements of the green infrastructure network are not only present as attractions but also as tourism infrastructure for the inhabitants of a region or municipality and for tourists visiting it.

The aims of the present research were

- to explore the potential of linking green infrastructure development and tourism development
- to examine the state of green infrastructure and tourism, their development potential and the interconnection of their development in a specific region, the Nivegy Valley, and

– to explore how conscious green infrastructure planning can contribute to the development of tourism – not only in times of pandemic.

### **3. Background and Literature Review**

In our research, we interpret the concept of green infrastructure according to the MEA (2005), as defined in the Hungarian National Biodiversity Strategy: 'Green infrastructure is defined as a strategically planned network of natural and semi-natural areas and other vegetated and ecologically functional areas, designed and managed to provide a wide range of ecosystem services. The backbone of the green infrastructure consists of green spaces/green areas ("green" elements) and water surfaces ("blue" elements)." (NBS 2015)

Over the past decades, the ecosystem services (ES) approach has become a significant and influential concept in environmental, economic and social decision-making (de Groot et al. 2010; Plieninger et al. 2013). The ES provides services that are necessary and beneficial for human well-being (Constanza et al. 1997; MEA 2005). There are several ways of grouping them, the most common of which are: provisioning services, regulatory services, support services and cultural services (CES) (MEA 2005; Cheng et al. 2019). There are several classifications of CESs, the most used of which are those developed by MEA (2005): spiritual and religious; recreational and ecotourism; aesthetic; inspirational; educational; 'spirit of place'; heritage values and services. The unit of service is a part of the landscape used and transformed by man, but the value of the CES is highly dependent on the perception of the individual.

Recreation, according to the tourism theory literature, is a leisure activity in which we engage with our health, well-being and quality of life away from the compulsory activities. The aim of recreation as a culture of leisure is therefore to restore the individual's ability to work through recreation, creating the basis for a quality life (Révész et al. 2015). Tourism is related to, but only partially overlaps with, recreation. Tourism is generally defined as an activity that involves leaving one's permanent residence and typically involves spending income to access services. The primary purpose of tourism is to provide or obtain experiences (Michalkó 2012), often drawing on the special character, beauty and values of the landscape. Therefore, it is necessary to focus attention on the basic structure of the landscape, the green infrastructure and the importance of its ecosystem services, so that they are not degraded in the future (Wallace 2007; Abualhagag and Valánszki, 2020).

Green infrastructure planning considers value protection, local development objectives and built infrastructure design considerations (Benedict and McMahon 2006), and multifunctional green infrastructure planning can therefore be an effective tool for tourism development, which is also multifaceted.

Restrictions imposed because of the COVID19 epidemic, which continues to this day, have had a significant impact on tourism, with a drastic drop in overnight stays by foreign visitors in 2020, while the decrease in domestic stays was much smaller due to the summer peak. (Overall, travel activity fell by more than 13% in 2020 compared to previous years (KSH 2021). The district of Balatonfüred has similarly suffered from a lack of tourists. Accommodation facilities were generally inoperable during the closure period, with occupancy rates approaching 0 in the spring.

The peak in summer was only a few percent lower but was limited to a shorter period than in other years (INT-04).

However, the Lake Balaton region is not only an attractive destination for tourists, but increasingly also for people looking for a second home. During the pandemic, many people also chose holiday homes as a second home, where they could survive the periods of closure. Many people bought property in the Lake Balaton area last year. In the Balatonfüred district, prices have reached those of the capital, and in a few months the population of the ageing Balaton Special Resort District has increased by 0.7% (INT-03). This period has also meant changes in consumption and space use patterns and additional pressures, which often require cooperation between municipalities and other relevant organisations (Fekete-Dombi-Oláh 2020). In the past, tourists preferred improvements in infrastructure, programme offerings, longer opening hours and pet-friendly services (Sulyok et al. 2020). During the pandemic, however, these services were not available, and the increased 'population' sought outdoor venues for family and friends' gatherings and leisure. The need for day trips and sports activities was outlined (Madarász 2020). Spending time outdoors was valorized during the pandemic, and there were especially many family hikers on the hiking trails (INT-01). We observed that open spaces that were not developed for tourism purposes, such as dirt roads in agricultural areas, also became popular destinations.

In our research, we have identified green infrastructure elements in the Nivegy Valley to meet these needs and their potential for development, which, if implemented, will both provide opportunities for tourism in a possible additional pandemic situation, but also contribute to the recreation of tourists, second-home buyers and locals in normal conditions.

#### **4. Method and Data**

Our first studies in the Nivegy Valley were conducted in 2015, when the Tourism and Landscape Development Study (Nivegy Study 2015), which forms the basis of this paper, was completed. We have subsequently returned to this area of the Lake Balaton Uplands for various research purposes - to investigate the relationship between the landscape and its inhabitants, and the relationship between green infrastructure and tourism on a larger scale (Valánszki -Dancsókné -Filepné, 2018). In the following, we briefly describe our study area and summarize the applied research methodology.

The Nivegy Valley is located at the western edge of the Balatonfüred district (357.8 km<sup>2</sup>, 25 247 inhabitants (INT-04)), and includes five settlements, Szentjakabfa, Óbudavár, Balatoncsicsó, Szentantalfa and Tagyon (total 31.6 km<sup>2</sup>, 1008 inhabitants (INT-04)), which still preserve features of the medieval landscape structure. Szentantalfa (69.8) and Balatoncsicsó (105.9) have low ageing indicators, but the other settlements are characterized by a high ageing rate. Net income per inhabitant is lower than the national average, except for Tagyon. The number of registered enterprises is much lower than in the coastal settlements, and the share of agricultural enterprises is relatively high (Szentjakabfa 35.7%, Szentantalfa 48.1%, Balatoncsicsó 42.1%, national average 27.4%). The share of registered enterprises in services (2014 data) is also low compared to the national average (Szentjakabfa 35.7%, Szentantalfa 20.1%, Balatoncsicsó 32.9%, national average 62.6%), and half the value of the coastal settlements (INT-02).

The wine-growing landscape is a valley overlooking Lake Balaton, which is closed by a small hill to the south, so the villages in the valley do not have a Balaton shore and are therefore marginalized from a tourist point of view. Nevertheless, they are involved in wine tourism through the vineyards and wine production (Figure 1.), and a wine route has been developed, but the valley also has many sacred sites and hiking trails with other tourist potential. In times of pandemic, places that are less crowded and less visited have become more valuable, and the experience gained in the Nivegy Valley could be useful for tourism development projects that include pandemic preparedness among their objectives. Therefore, we compared green infrastructure elements with the ecosystem services they mediate, which have relevance for tourism, to illustrate the linkages between green infrastructure development and tourism development.

We analysed the state of green infrastructure elements first with desktop studies, later by field survey. We explored the gaps and conflicts related to the state of GI, furthermore we highlighted those GI elements which can serve as tourist attractions. Based on historic maps and different databases (website TÉKA - [Inventory of Landscape Values] websites of the settlements) and on field survey we defined and collected the natural and cultural heritage elements representing tourist attractions as well. Based on the parallel assessment we elaborated proposals to fill the gaps, solve the conflicts and improve green infrastructure network in order to promote tourism.

The contribution of landscape features to the attractiveness of the area for tourism and the ecosystem services that can be provided by green infrastructure development to tourism development were examined. Our recommendations are based on these findings.

## **5. Results**

The first result of our research was to explore the theoretical relationship between green infrastructure, ecosystem services and tourism. This relationship is illustrated in Figure 2 below. Tourism infrastructure, including tourism services, that facilitate and enable access to ecosystem services plays a crucial role in the realization of tourism and recreation activities. On the other hand, the attractiveness of both the destinations and the tourism infrastructure can be enhanced through the provision of GI. We have sought to apply these principles in the design of the development of the specific sample site.

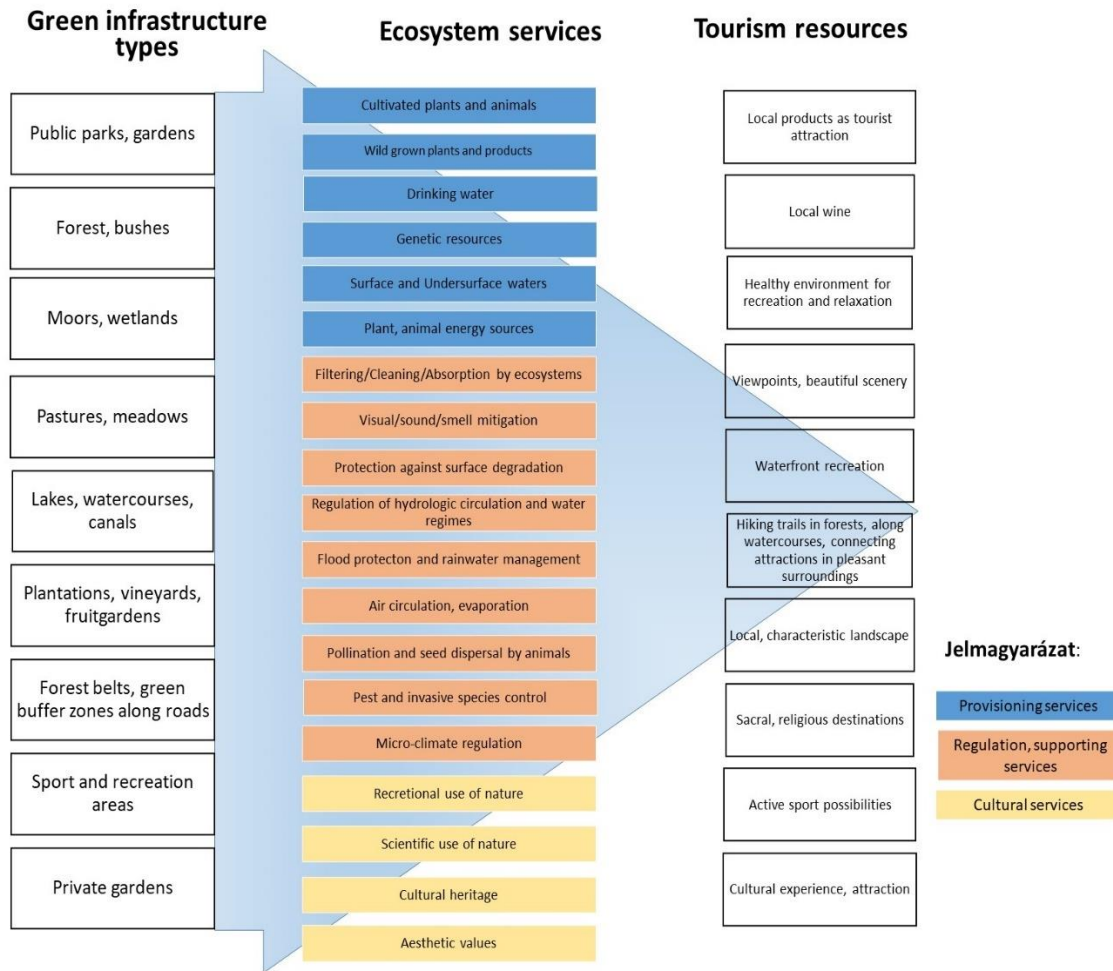
In the sample area, a significant part of the freely accessible green infrastructure elements is made up of patchy forests, which are generally in good condition, although contaminated with non-native invasive species. In some places, very valuable stands of mature trees and protected forests are also present (Csicso forest). The vineyards and orchards, which are typical of the Balaton Uplands, are well-maintained and are increasingly being replanted, especially in the upland areas, while on the steeper hillsides, cultivation is being abandoned in several places. Similarly, upland meadows and pastures are being afforested. Many of the small watercourses are intermittent and their banks often lack natural vegetation. The green infrastructure in the settlements is well maintained and varied. The hillsides of some of the settlements offer a particularly beautiful panorama, which is currently enjoyed by visitors to the well-kept cemeteries and vineyards. (Valánszki et al., 2017)



**1. Figure View of the Nivegy Valley from the northern entrance to the valley** (Photo: Dancsokné Fóris, Edina)

Among the limited green infrastructure elements available, the recreational, health and religious gardens or other institutional facilities in the built-up area of municipalities are well maintained. Sports fields are well maintained, but their surroundings are generally untidy and of no natural value. Only a few small estates, which occur in hilly areas, form a group of estates that are not accessible to the community (Valánszki et al., 2017).

Tourism-friendly features include: diverse landscape, extensive woodlands and vineyards, traditional cellars, the spectacle of grazing animals, varied topography and occasional scenic views, gallery forests along streams, many hiking trails and dirt roads exploring the area, and small watercourses, complemented by a number of cultural values such as medieval church ruins, folk architecture, traditional buildings, structures, other unique landscape values.



**2. Figure Green infrastructure, ecosystem services as resources for tourism** (Edited by authors based on study of MTA Ökológiai Kutatóközpont, Ormos Imre Alapítvány 2017)

Although the municipalities of the valley are not directly on the waterfront, tourism is still present in the municipalities, especially with the boom in wine tourism. Youth and religious tourism are also a feature of the micro-region, due to the presence of a large number of collective accommodation facilities and sacred sites. Wedding packages are becoming increasingly popular, hiking trails and educational trails, and forest accommodation is responding to the needs of those interested in ecotourism. The small villages, with their traditional Swabian architecture and folk architecture, are becoming increasingly popular with tourists.

The five villages in the valley are rich in local products: goat and cow milk products, honey, smoked pork, ceramics and carved wood, as well as special chocolates and herbs. Other important attractions are the various programmes, such as wine festivals, the blessing of the Balázs Day, village festivals, special programmes in the youth hostels and the Paul Kinizsi Memorial Tour. The national blue trail runs through the area, but there are also red and green signposted routes, which are complemented by three thematic trails (the Old Beech Study Trail, an alternative section of the Mary's Trail and the Married Couples' Trail).

The network of tourist routes in the area is good, but we saw the need to create some links or new sections of routes to develop tourism based on the characteristics and values of the Nivegy Valley.

In formulating these proposals, our main objective was to achieve and maintain a mosaic landscape structure and an attractive landscape, presenting the unexplored values while protecting vulnerable elements. Our proposals include proposals for the development of attractions, tourism infrastructure development and the development of green infrastructure to serve tourism. On the latter aspect:

- creating visual links
- construction of a scenic lookout, integration into the network of tourist routes
- creation of circular itineraries covering all the valley's attractions and the interior of the five municipalities
- shading of the tourist routes
- creation of rest and picnic areas for hikers and cyclists
- creation of thematic rest areas at former mills, ruins and valuable natural sites
- landscaping around the church ruins to cater for the needs of wedding tourism
- creation of horse-riding trails
- creation of a hiking trail along the whole area of the Cserkúti stream, with a wooden boardwalk in the meadow areas
- creation of a new path in the gorge-like forest between Szentantalfa and Tagyon, with wooden planks in the necessary places and night lighting to make the riverbed accessible
- integration of disturbing structures (wine storage) into the landscape
- reclassification of arable land as meadow alongside watercourses
- creation of a valley-barrier reservoir and flood peak reduction reservoir in the confluence area, with a footpath around it.

To preserve the mosaic landscape structure and the attractive landscape, it is also necessary to create and maintain an orderly townscape that reflects tradition. The preservation of traditional forms of farming can help to maintain the landscape. In the case of the Nivegy Valley, this certainly lies in the maintenance of vineyards and pastures. In addition, the value of semi-natural habitats, which are an essential element of the landscape, is of particular importance. In terms of green infrastructure, it is important to create continuity and connectivity, to highlight visual links and to protect and showcase the value of the blue infrastructure linked to water. The accessibility of the landscape through the proposed development of green infrastructure and the inclusion of cultural assets on routes will create a meaningful attraction for tourism.

In the Lake Balaton area, holiday homeowners can in some cases form a transition between tourists and residents, as demonstrated by their activities to meet their recreational needs during the pandemic. The development of green infrastructure can serve the recreational needs of both tourists and residents.

## **6. Discussion and Conclusion**

For recreation through tourism activities, tourism infrastructure, including tourism services, which facilitate and enable access to ecosystem services, plays a crucial role. On the other hand, the attractiveness of both the attraction and the tourism infrastructure can be enhanced through the provision of GIS.

In order to make the most of ecosystem services, green infrastructure planning is needed that goes

beyond the territory of individual tourism service providers and even beyond the territory of individual municipalities: a spatial approach is required.

Tourism and green infrastructure development are therefore closely interlinked and interact. Therefore, it is important to mainstream the preservation of green infrastructure and the protection of ecological services in spatial planning and sectoral decision-making (including tourism development).

The development of green infrastructure and its ecological services, which also serve tourism, is also an essential tool for climate adaptation, which is also a major challenge today.

The aim is for developments to strengthen synergies to achieve a greener, more diverse and healthier environment.

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